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United States
Department Of
Agriculture

Forest
Service

Shasta-Trinity National Forest
2400 Washington Avenue
Redding, CA 96001

Reply To: 3420

Date: July 26, 1989

Subject: Evaluation of potential for buildup of bark beetles in blowdown
on Covelo RD, Mendocino NF (Rept. No. N89-15).

To: Forest Supervisor, Mendocino NF

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High winds during mid-December 1988 caused numerous scattered areas of blowdown on the Covelo RD. Forest Timber Management Officer Paul Schuller requested an evaluation of the situation. Some representative areas were examined on July 12, 1989 by Dave Schultz from the Forest Pest Management Northern Service Area, and Brooks Smith, Covelo RD Timber Management Officer.

Areas of blowdown have been detected in numerous locations on the Covelo RD between 3,000 to 6,000 feet in elevation. Virtually all forest types have some areas of blowdown. Most of the areas where blowdown occurred had previously been stands of mature to overmature sawtimber with fairly closed canopies. Some of the areas met the criteria for suitable spotted owl habitat prior to being damaged by wind.

The type and extent of tree damage varied widely. The following types of wind damage were seen: partial defoliation by removal of needles or small twigs, broken tops, missing branches, windthrow with complete removal of rootmass from the soil, windthrow with one or more roots intact in the soil, standing or leaning trees with a large basal split, complete shearing at the ground line, and trees snapped out at various heights. Some of the areas identified have light or scattered damage, while others have very few trees left standing on areas of up to a section in size.

Several units in each of three proposed salvage sales were examined to sample a range of timber types and damage conditions. The Howard Sale is generally located in T. 23 N., R. 10 W. The stands were primarily composed of older red fir and white fir. All types of wind damage had occurred. Because of the elevation, the season was not very advanced and there were no signs of any beetles infesting any of the blowdown or damaged trees.

The Bredehoft Sale is in T. 22 N., R. 10 W. The stands were primarily ponderosa pine. Wind had snapped out a high proportion of the stand at a height of 20 to 30 feet above the ground in one area. This was the lowest elevation stand examined and the season was the most advanced. Red turpentine beetle, Dendroctonus valens, had already attacked and emerged from the standing boles. The only insects currently in the standing boles were termites. The snapped out tops were infested with pine engravers, Ips spp., which were in the pupal stage.

The Armstrong Sale is located in T. 20 & 21 N., R. 10 W. The stands were fairly dense old growth mixed conifer. Wind damage varied from scattered blowdown and snap-outs to areas where 95 percent of the overstory was on the ground. Because





because numerous susceptible trees and a large population of fir engravers are already present. The population of fir engravers may increase by breeding in blowdown but because the population is already large enough to occupy most of the susceptible hosts, the addition of extra beetles should not significantly increase the amount of mortality.

Pine engravers can breed in fresh pine slash, sapling to pole size standing pines, and the tops of standing sawtimber. There are usually 2 of 3 generations during the warm part of the year, plus an overwintering generation. Slash makes the greatest contribution to building pine engraver populations during the spring. The overwintering generation that emerges in the spring is usually small, and standing hosts generally are resistant to attack at that time. Slash contributes proportionally less to pine engraver populations during the summer because populations are usually high by that time, and standing host resistance has dropped due to moisture stress. Some of the damaged pine in the pine and mixed conifer types are infested with pine engravers that will emerge by mid-August. A considerable amount of uninfested pine material is also available for breeding by fall or overwintering generations. Some of the largest pieces may still be suitable breeding habitat in the spring of 1990, but most of it should be deteriorating rapidly at that point.

Adult pine engravers usually travel less than a quarter mile after emergence before initiating an attack. To the extent that infested or potential host material can be removed or burned before pine engravers emerge, some localized pine mortality can be prevented. If pine engraver populations are able to build up in slash, the populations usually decline rapidly after they move into standing trees.

Summary

A number of beetle species are breeding in blowdown on the Covelo RD. Most of these pose little or no threat to standing timber. Pine engravers currently infesting blowdown have the potential to emerge and cause localized pine mortality. Large diameter pine blowdown will remain suitable for pine engraver breeding through 1989, and possibly into early 1990.

Current tree mortality is higher than normal because of below normal precipitation during the previous three years. Mortality will remain high in all areas until precipitation returns to normal.

Most of the trees snapped or uprooted by wind were the tallest dominants and codominants with the largest crowns. With certain exceptions, many trees left standing were intermediate and suppressed trees with small crowns composed largely of shade needles. Additionally, trees standing in or around the blowdown areas were severely buffeted by wind. Some have lost parts of the crown and other trees may have root shearing or other damage which is not readily apparent. It will take several years before these trees begin adding new crown and improving in vigor. During that period, these trees will be susceptible to a variety of bark beetles, engraver beetles, flatheaded borers, and roundheaded borers. Mortality of standing trees in, and around, areas of significant blowdown is likely to be high for at least 3 or 4 more years.

Management Alternatives



1. Do nothing. This assumes there would be no salvage or other work done in the blowdown areas. Because soil moisture is low and numerous trees are under stress, above normal levels of tree mortality will occur during 1989 and 1990 on most areas of the District. Generalized tree mortality should decrease within a year after precipitation returns to normal. Pine engravers which build up in pine blowdown will cause some additional localized pine mortality in 1989 and possibly 1990. Pine mortality will be similar to that of other species after the supply of fresh pine blowdown is depleted. Blowdown areas in which crown closure has decreased by more than about one-third have some stressed trees that will remain highly susceptible to beetle attack for several years.

The ground in areas of heavy blowdown will be covered with large amounts of woody debris for many years. Ponderosa pine and white fir under about 36 inches diameter will show substantial deterioration within 2 to 3 years. Douglas-fir over 20 inches and sugar pine over 30 inches diameter will retain sound heartwood for 10 years or more. Woody debris on the surface of the ground will tend to inhibit natural regeneration until the debris is in an advanced state of decay.

2. Salvage blowdown. The removal of pine infested with pine engravers before the new generation emerges would prevent some mortality of nearby standing pines. Likewise, the removal of green pine host material before it becomes infested will prevent some mortality. Salvage of other species of blowdown should have little effect on lowering subsequent mortality. Because salvage operations will cause some site disturbance, living residual trees may be more susceptible to beetle attack than trees in areas which are not salvaged. Removal of woody material and scarification of the soil during logging should result in some natural regeneration.

3. Salvage and sanitize blowdown areas. Identification and removal of pines with a high probability of being attacked by bark beetles over the next few years may prevent some bark beetle group kills in the pine type. In areas where green pines would be cut, slash can be treated to prevent a buildup of pine engravers. Slash treatment methods which have been successfully used in timber sales include utilization to the smallest diameter practical, complete lopping of limbs to reduce shading, bucking stems into the shortest practical lengths, and waiting until the material is dry before piling.

Sanitation in the other forest types will probably have only a minor effect on further mortality. Dwarf mistletoe was not common in the areas examined, but there may be opportunities to remove overstory sources of infection in areas where the understory will be managed. The primary benefit of removing the trees likely to die in a single operation is to reduce the number of entries and the amount of site disturbance.

4. Make logical silvicultural units. Some additional mortality should be expected in all areas. Those areas which had only light or scattered blowdown will probably still have enough stocking after subsequent mortality to be carried for some period of time. Areas which had more extensive wind damage may experience considerable mortality of standing trees over the next few years. It may be advantageous to consider a single regeneration harvest in areas which already have marginal stocking, rather than making multiple entries as additional mortality further reduces stocking. If dwarf mistletoe is absent, it should not seriously affect the health of future stands to leave scattered





overstory trees or groups of advance regeneration for wildlife, or visual and biological diversity.

If you have questions about this evaluation or need further assistance, please call Dave Schultz at 916-246-5087.

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